

WHAT IS CLAIMED IS:

1. An optical coating, comprising:

at least one anti-reflective layer having an admittance between that of a gain media and an adjacent media;

an absentee layer having an index of refraction greater than said gain media and having a thickness corresponding to a number of half waves.

2. The optical coating as recited in claim 1 wherein a thickness of said absentee layer comprises:

$$d = \frac{m\lambda}{2n}$$

where d is the thickness of said absentee layer,  $\lambda$  is a center wavelength to be output by the gain media, n is the refractive index of the absentee layer, and m is the number of half-waves.

3. The optical coating as recited in claim 2 wherein said gain media comprises InGaAsP.

4. The optical coating as recited in claim 3 wherein

said anti-reflective layer comprises:

a first layer comprising Ta<sub>2</sub>O<sub>5</sub>;

a second layer comprising SiO<sub>2</sub>; and

said absentee layer comprises Si.

5. The optical coating as recited in claim 4 wherein said absentee layer has a thickness corresponding to 1-7 half-waves.

6. The optical coating as recited in claim 4 wherein said absentee layer has a thickness corresponding to 3-4 half-waves.

7. The optical coating as recited in claim 4 wherein said adjacent media comprises air.

8. A method to mitigate reflection, comprising:

applying an absentee layer having a thickness corresponding to a number of half wave thicknesses to an optical media, said absentee layer having an index of refraction greater than that of said optical media; and

applying an antireflective layer comprising at least one material having an admittance between that of said optical media and an adjacent media.

9. The method as recited in claim 8, wherein

the thickness of the absentee layer comprises:

$$d = \frac{m\lambda}{2n}$$

where  $d$  is the thickness of said absentee layer,  $\lambda$  is a center wavelength to be output by the gain media,  $n$  is the refractive index of the absentee layer, and  $m$  is the number of half-waves.

10. The method as recited in claim 8 wherein said optical media comprises a laser gain media.

11. The method as recited in claim 10, wherein said laser gain media comprises InGaAsP and said absentee layer comprises Si.

12. The method as recited in claim 11, wherein applying said anti-reflective layer comprises:

applying a first layer comprising  $\text{Ta}_2\text{O}_5$ ;

applying a second layer comprising  $\text{SiO}_2$  and;

wherein said absentee layer comprises Si.

13. The method as recited in claim 12 wherein said absentee layer has a thickness corresponding to 1-7 half-waves.

14. The method as recited in claim 12 wherein said absentee layer has a thickness corresponding to 3-4 half-waves.

15. The method as recited in claim 8 wherein said adjacent media comprises air.

16. The method as recited in claim 9 further comprising:

calculating a plurality of halfwave thickness for the absentee layer by  
allowing a plurality of wavelengths in a range to be the center wavelength  $\lambda$ ;  
arithmetically calculating an optimal thickness for the absentee layer using  
said plurality of halfwave thicknesses.

17. A laser comprising:

a tunable gain media to output a range of wavelengths around a center  
wavelength  $\lambda$ ;  
at least one anti-reflective layer having an admittance between that of said  
gain media and an adjacent media;  
an absentee layer having an index of refraction greater than that of said  
gain media, said absentee layer having a thickness  $d$  determined as:

$$d = \frac{m\lambda}{2n}$$

where  $d$  is the thickness of said absentee layer,  $\lambda$  is the center wavelength  
to be output by the gain media,  $n$  is the refractive index of the absentee layer,  
and  $m$  is an integer number of half-waves selected to optimize performance of  
said antireflective layer over said range of wavelengths.

18. The laser as recited in claim 17 wherein said adjacent media is air.

19. The laser as recited in claim 17 wherein  $m$  comprises 1-7.

20. The laser as recited in claim 17 wherein m comprises 3-4.

21. The laser as recited in claim 17 wherein said gain media comprises InGaAsP.

22. The laser as recited in claim 21 wherein said antireflective layer comprises:

a first layer comprising  $\text{Ta}_2\text{O}_5$ ;

a second layer comprising  $\text{SiO}_2$ ; and

said substrate layer comprises Si.